



National Child Care Information Center

A service of the Child Care Bureau

NCCIC

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BRAIN DEVELOPMENT RESEARCH

The following resources include a sample of national and State [organizations](#) (listed in alphabetical order) with an interest in sharing information on research on brain development in order to promote healthy growth among young children; additional publications that describe the research about brain development and the implications for [parenting and programming](#); and publications that describe how information about brain development can be used to create [policies](#) about early care and education.

NATIONAL and STATE ORGANIZATIONS

■ Better Brains for Babies (BBB) Initiative

World Wide Web: <http://www.fcs.uga.edu/outreach/coopex/bbb/>

BBB is a collaboration of State, local, public, and private organizations dedicated to promoting awareness and education about the importance of early brain development in the healthy growth and development of infants and young children in Georgia. BBB shares research on brain development through their Web site (the What You Need To Know link); a speaker's bureau of trained volunteers who can speak to community organizations and professional groups about brain research; a lending library; and train-the-trainer workshops. The What Information is Available link provides information on fact sheets, resources, and additional Web sites.

■ National Association for the Education of Young Children (NAEYC)

1509 16th Street NW

Washington, DC 20036

800-424-2460 or 202-232-8777

World Wide Web: <http://naeyc.org>

NAEYC is a nonprofit professional organization dedicated to improving the quality of care and education provided to our nation's young children. NAEYC has over 100,000 members, teachers, administrators, parents, policy-makers, and others committed to bringing high-quality early education and care to all young children. In addition to the bimonthly journal *Young Children*, NAEYC publishes an extensive array of books, brochures, videotapes, and posters. NAEYC resources on brain development include the following:

- "Applying Brain Research to Create Developmentally Appropriate Learning Environments" (September 2001), in *Young Children* Vol. 56, No. 5, by Stephen Rushton, notes that brain research confirms the validity of many developmentally appropriate practices, as well as proves the theoretical relevance of such child-centered constructivist theorists as Dewey, Piaget, and Vygotsky. Additional information is

available on the Web at <http://www.journal.naeyc.org/search/item-detail.asp?page=1&docID=2580&sesID=1107375162827>.

- “Caregivers’ Corner: Another Look at Brain Research” (July 2001), in *Young Children* Vol. 56, No. 4, by Melissa Vaught, discusses enrichment products marketed to parents, as well as the academic push in preschool for kindergarten readiness, as a threat to the value of interaction/play between children and adults. Additional information is available on the Web at <http://www.journal.naeyc.org/search/item-detail.asp?page=1&docID=2523&sesID=1107375221652>.
- “Research in Review: Achieving Best Practices in Infant and Toddler Care and Education” (July 1999), in *Young Children* Vol. 54, No. 4, by Mary McMullen, discusses how what occurs in the first three years of life is important to healthy development, and how best practice (identified as staff to child ratio, sensitive responsiveness, positive communication, and provision of developmentally appropriate activities) is essential to the achievement of optimal brain development during the infant and toddler years. Additional information is available on the Web at <http://www.journal.naeyc.org/search/item-detail.asp?page=1&docID=2308&sesID=1107375273099>.
- *Cooing, Crying, Cuddling: Infant Brain Development* (1998), by Child Care Collection, is a 28-minute video that explores the process of brain development during the first 15 months of life. Additional information is available on the Web at http://www.naeyc.org/shoppingcart/Itemdetail.aspx?Stock_No=897.
- *Laughing, Learning, Loving: Toddler Brain Development* (1998), Child Care Collection, is a 28-minute video on how to promote optimal brain development. Additional information is available on the Web at http://www.naeyc.org/shoppingcart/Itemdetail.aspx?Stock_No=898.
- “Do Early Childhood Experiences Really Count?” (1999), an *Early Years are Learning Years* release from NAEYC, discusses the positive impact of high-quality early childhood programs on brain development. This resource is available on the Web at <http://www.naeyc.org/ece/1999/13.pdf>.
- “Brain Development Research – What It Means for Young Children and Families” (1997), an *Early Years are Learning Years* release from NAEYC, reviews what has been learned about brain development, the effects of early care and education, and the importance of early intervention for learning. It also makes a number of recommendations on how to promote healthy development and discusses implications for policy and practice. This resource is available on the Web at <http://www.naeyc.org/ece/1997/11.pdf>.
- “New Brain Development Research – A Wonderful Window of Opportunity to Build Public Support” (May 1997), in *Young Children* Vol. 52, No. 4, by Julee Newberger,

discusses the complexity of the human brain and the association between neuroscience and education. Additional information is available on the Web at <http://www.journal.naeyc.org/search/item-detail.asp?page=1&docID=61&sesID=1107375396601>.

■ **National Network for Child Care (NNCC)**

World Wide Web: <http://www.nncc.org>

NNCC unites the expertise of many of the nation's leading universities through the outreach system of USDA Cooperative Extension. It provides practical information about children, parenting, and child care programming for parents, professionals, practitioners, and the general public. Information is available in English and Spanish. The section on intellectual development includes links to articles about brain development. This section is available on the Web at http://cyfernet.ces.ncsu.edu/cyfdb/browse_3.php?cat_id=36&category_name=Intellectual&search=NNCC&search_type=browse.

■ **National Scientific Council on the Developing Child**

Heller School for Social Policy and Management at Brandeis University
Mail Stop 035, P.O. Box 5491 10
Waltham, MA 02454-0110
919-929-8285

World Wide Web: <http://www.developingchild.net/index.shtml>

The National Scientific Council on the Developing Child is a multidisciplinary collaboration comprising many of the nation's leading scientists in early childhood development. It combines cutting-edge, interdisciplinary scientific knowledge on early child development with highly sophisticated communication research methods designed to ensure accurate public understanding of that science. The Council also trains scholars who are competent in public communications by integrating this unique collaboration into the curricula of selected academic institutions, beginning with The Heller School at Brandeis University. Publications from the Council about brain development include the following:

- “Children’s Emotional Development is Built into the Architecture of Their Brains” (Winter 2004) *Working Paper* No. 2, states that emotional development is built into the architecture of young children’s brains in response to their individual personal experiences and the influences of the environments in which they live. In addition to describing what science knows about emotional development, it debunks common myths about the emotional development of young children. It also discusses implications for policy and programs. This resource is available on the Web at <http://www.developingchild.net/papers/workingpaperII.pdf>
- “Young Children Develop in an Environment of Relationships” (2004), *Working Paper* No. 1 indicates that healthy development depends on the quality and reliability of young children’s relationships with the important people in their life, both within and outside the family. The development of children’s brain architecture depends on the establishment of these relationships. Young children experience their world as an environment of relationships, and these relationships affect virtually all aspects of their development (i.e.,

intellectual, social, emotional, physical, behavioral, and moral). Nurturing and stable relationships with caring adults are essential to healthy human development beginning from birth. Implications for policy and programs are described. This resource is available on the Web at http://www.developingchild.net/papers/paper_1.pdf.

■ **Parents' Action for Children** [formerly the **I Am Your Child Foundation**]

335 North Maple Drive, Suite 135

Beverly Hills, CA 90210

310-285-2385

World Wide Web: <http://www.parentsaction.org/>

Parents' Action for Children is a national nonprofit organization dedicated to advancing the interests of families and young children. Parents' Action develops parent education materials, connects parents with one another, and fights for issues such as early education, health care, and high quality and affordable child care. It has sought to educate millions of parents and professionals about breakthrough new discoveries in the process of brain development. Available resources include videos, booklets, bookmarks, and CD-ROMs, that include such titles as *Ready to Learn*, *Why Early Childhood Matters*, and *The First Years*.

■ **Talaris Research Institute**

World Wide Web: <http://www.talaris.org/>

Talaris Research Institute is dedicated to discovering how children think, feel, and learn. Talaris synthesizes research into practical applications for parents, caregivers, educators, healthcare providers, and the corporate community. The Spotlights link on the Talaris Web site provides research summaries on a variety of topics, including language acquisition, emotions, infant sleep patterns, the effects of stress on babies, imitative behavior and memory, stranger anxiety, and hypothesis testing. These "crib notes" bring to life research efforts that have deepened the understanding of children's development. Three one-minute video versions of Spotlights offer a short introduction to the Spotlights on Imitative Behavior, Hypothesis Testing and Speaking Parentese, which can be viewed on the Web. Talaris also produces a research-based timeline that can serve as a general guide to the five ways a child grows. Additional resources and information on research are also available.

■ **ZERO TO THREE: National Center for Infants, Toddlers, and Families**

World Wide Web: <http://www.zerotothree.org>

ZERO TO THREE is a national organization focused exclusively on issues affecting infants and toddlers. They host the Web site, Brain Wonders, which offers information to parents, child care providers, and pediatric and family clinicians about how the brain develops, within the context of relationships, from conception through age 3. Brain Wonders is available on the Web at <http://www.zerotothree.org/brainwonders/index.html>. In addition, the following resources about child development are available from ZERO TO THREE.

- *Developmental Milestones: How I Grow in Your Care* contains charts for parents to track their child's developmental progress. The charts include: "Birth to 8 Months: Young Infants," "8 to 18 Months: Explorers," and "18 Months to 3 Years: Toddlers and Two-Year-Olds." This resource is available on the Web at http://www.zerotothree.org/dev_miles.html.
- *Healthy Minds: Nurturing Your Child's Development* (2003), is a series of seven handouts which summarizes key findings of brain development research and offers suggestions to parents on how to nurture their child's healthy development. Handouts include:
 - "Healthy Minds: Nurturing Your Child's Development From 0–2 Months;"
 - "Healthy Minds: Nurturing Your Child's Development From 2–6 Months;"
 - "Healthy Minds: Nurturing Your Child's Development From 6–9 Months;"
 - "Healthy Minds: Nurturing Your Child's Development From 9–12 Months;"
 - "Healthy Minds: Nurturing Your Child's Development From 12–18 Months;"
 - "Healthy Minds: Nurturing Your Child's Development From 18–24 Months;"
 - and
 - "Healthy Minds: Nurturing Your Child's Development From 24–36 Months."

These resources are available on the Web at <http://www.zerotothree.org/healthyminds/>.

- *Starting Smart: How Early Experiences Affect Brain Development* (2000) 2nd ed., by ZERO TO THREE and The Ounce of Prevention Fund, examines the effects of early experiences on infant brain development. This resource is available on the Web at <http://www.zerotothree.org/startingsmart.pdf>.

ADDITIONAL PUBLICATIONS ON BRAIN DEVELOPMENT

The following highlights a sample of national and State research, including both current materials and key historical documents on this issue.

■ "Early Brain Development in Children and Learning" (2004), in *Writer Bytes*, by American Academy of Pediatrics (AAP), discusses the first three years of a child's life as important for stimulating the learning process. This resource is available on the Web at <http://www.aap.org/mrt/brain.htm>.

■ *Rethinking the Brain: New Insights into Early Development* (1997; revised October 2003), by Rima Shore, published by the Families and Work Institute (FWI), is a major research document that summarizes the key findings of brain research and the implications for policy and practice. Availability information is on the Web at <http://www.familiesandwork.org/index.asp?PageAction=VIEWPROD&ProdID=82>.

FWI has translated the science of brain development research from the report *Rethinking the Brain* into a Presentation Kit designed for a broad array of audiences and presenters. The visuals

help guide audiences beyond the science by linking brain development research to children's cognitive, social and emotional development, and summarize the lessons learned from this research. FWI also highlights the significant implications of this research for families, educators, policy-makers, child care providers, and others concerned about healthy development of young children. Additional information is available on the Web at <http://www.familiesandwork.org/index.asp?PageAction=VIEWCATS&Category=210>.

■ “Brain Research and Its Implications for Early Childhood Programs” (July/August 2001), in *Child Care Information Exchange* (CCIE), by Child Care Information Exchange, Inc., discusses how brain development is contingent on a complex interplay between genes and environment, how early experiences contribute to brain structure and capacities, how early interactions affect brain “wiring,” how the brain develops nonlinearly, and how a child's brain is two and a half times as active as an adult's. This resource is available on the Web at http://www.corsp.org/kids_family/Parent%20Activities/Brain%20Research%20and%20Its%20Implications%20for%20EC%20Programs.pdf. CCIE also includes this information in a training kit, Brain Research and Its Implications for Early Childhood Programs. Additional information about this kit is available on the Web at http://secure.ccie.com/catalog/product_info.php?products_id=4500602.

■ “Development in the First Years of Life” (Spring/Summer 2001), in *The Future of Children* Vol. 11, No. 1, ed. Ross A. Thompson, explains brain development and links it to the growth of the body (size and coordination), the growth of the mind (language and problem-solving abilities), and the growth of the person (emotional and social mastery). It emphasizes how much early experiences and relationships matter. The accomplishments of infancy are considered in light of the importance of the environment for early development and the opportunities and vulnerabilities of the early years. This resource is available on the Web at http://www.futureofchildren.org/information2826/information_show.htm?doc_id=79334.

■ *Fact Sheet on the Importance of Reading to Infants and Young Children* (2001), by Association of American Publishers, presents facts on the importance of reading to infants and young children. Neuroscience research shows that reading aloud actually stimulates the growth of a baby's brain. This resource is available on the Web at <http://www.publishers.org/conference/pubinfo.cfm?PublicationID=6>.

■ “Understanding the Effects of Maltreatment on Early Brain Development” (October, 2001), in *In Focus*, by the National Clearinghouse on Child Abuse and Neglect Information, Child Care Bureau, Administration for Children and Families, U.S. Department of Health and Human Services, describes the research on brain development and specifically the effects of abuse and neglect on the developing brain during infancy and early childhood. Chronic stress or repeated trauma can result in a number of conditions: hyper-arousal, dissociation, disrupted attachment, lack of stimulation, and global neglect. Intensive, early interventions are the key to minimizing the long-term effects of early trauma on children's brain development. Research on brain development should be used to expand and strengthen prevention efforts. This resource is available in HTML on the Web at <http://nccanch.acf.hhs.gov/pubs/focus/earlybrain/>. A PDF version is available on the Web at <http://nccanch.acf.hhs.gov/pubs/focus/earlybrain/earlybrain.pdf>.

■ *Annotated Bibliography of Resources on Enhancing Brain Development* (November 2000), by the Center for Prevention and Early Intervention Policy, is an infant and toddler training resource guide that lists CD-ROMs, videos, and print resources that focus on brain development. This resource is available on the Web at http://www.cpeip.fsu.edu/resourceFiles/resourceFile_16.pdf.

■ *From Neurons to Neighborhoods: The Science of Early Childhood Development* (2000), eds. Jack P. Shonkoff and Deborah A. Phillips, by the Committee on Integrating the Science of Early Childhood Development, Board on Children, Youth, and Families, Commission on Behavioral and Social Sciences and Education, National Research Council and Institute of Medicine is a comprehensive study about early childhood. The report discusses:

- All children are born wired for feelings and ready to learn;
- Early environments matter and nurturing relationships are essential;
- Society is changing and the needs of young children are not being addressed; and
- Interactions among early childhood science, policy, and practice are problematic and demand dramatic rethinking. (page 4)

This resource is available on the Web at <http://www.nap.edu/books/0309069882/html/>.

■ *Nature Nurture and Early Brain Development* (January 2000), by Sara Gable and Melissa Hunting, Missouri University Extension, University of Missouri-Columbia, looks at early brain development from both the biological and environmental perspectives. The differences between critical and sensitive experiences are discussed. This resource is available on the Web at <http://muextension.missouri.edu/xplor/hesguide/humanrel/gh6115.htm>.

■ *Poverty and Brain Development in Early Childhood* (June 1999), by the National Center for Children in Poverty (NCCP), discusses brain development and how “risk factors can influence the brain through multiple pathways.” (page 1) This resource is available on the Web at <http://www.nccp.org/media/pbd99-text.pdf>.

■ *Special Report: How a Child’s Brain Develops* (February 3, 1997), *Time Magazine*, focuses on early brain development research. Articles include: “Fertile Minds,” by J. Madeline Nash; “The Day Care Dilemma,” by James Collins; “Hollywood Goes Gaga,” by Jeffery Ressler; and “Comfort and Joy,” by former First Lady Hillary Rodham Clinton. Additional information is available on the Web at <http://www.time.com/time/magazine/archive/covers/0,16641,1101970203,00.html>.

■ *Starting Points: Meeting the Needs of Our Youngest Children* (1994), by the Carnegie Corporation of New York, discusses the importance of the first three years of children’s lives, and includes recommendations for meeting those needs at the community level. An abridged version of this resource is available on the Web at http://www.carnegie.org/starting_points/. Additional information is available from the Carnegie Corporation of New York at 800-998-2269.

PUBLICATIONS on the IMPLICATION of BRAIN DEVELOPMENT RESEARCH on POLICY/PROGRAMMING

■ *Early Learning Left Out: An Examination of Public Investments in Education and Development by Child Age* (February 2004), by Voices for America's Children and the Child and Family Policy Center, is a study that examined public investments in the education and development of children during the early learning years (0–5 years), the school-aged years (6–18 years), and the college-aged years (19–23 years). It is based upon detailed analyses of State, Federal, and school district spending in 12 States across the country in FY 2001. It notes that while 85 percent of a child's core brain structure is formed by age 3, less than 4 percent of public investments on education and development have occurred by that time. Although there are some variations in spending across the 12 States, all show large investment gaps between investments made in the early learning years compared with those made in the school-aged and college-aged years. There is strong public support and advocacy for expanding investments in early learning and closing the investment gap. This resource is available on the Web at

<http://www.voicesforamericaschildren.org/AMTemplate.cfm?Section=ELLO&Template=/ContentManagement/ContentDisplay.cfm&ContentID=3384>.

■ *Child Welfare and School Readiness: Making the Link for Vulnerable Children* (2003), by Linda McCart and Charles Bruner, with Patricia Schene, published by the State Early Childhood Policy Technical Assistance Network, is a research brief designed to strengthen the connections between child welfare and other early childhood services in State and national efforts in order to promote and enhance optimal child development. It provides a brief overview of the school readiness–policy background and draws upon the growing evidence from brain research, child development, and child welfare to show the need to address developmental issues of children in the child welfare system. It also describes roles that the child welfare system can play in better addressing the educational and developmental needs of young children in their system. Finally, it includes additional examples of promising approaches for strengthening responses to the nation's most vulnerable babies, toddlers, and preschoolers. This resource is available on the Web at <http://www.finebynine.org/pdf/CWSR.pdf>.

■ *How Does High Quality Child Care Benefit Business and the Local Economy?* (2003), by the Economic Opportunity Institute, notes that brain development research and longitudinal studies of high-quality preschool programs confirm the importance of children's early learning and care experiences to their future academic success and employee productivity. Early education is the most cost-effective way to decrease the number of unskilled adults in the future. This resource is available on the Web at <http://www.eoionline.org/ECEChildcareEconomyBenefits.pdf>.

■ *Promoting School Success: Closing the Gap Between Research and Practice* (2003), by the Child Development Policy Institute Education Fund, published by the Child Development Policy Institute, partially funded by the David and Lucile Packard Foundation and the Morris Family Foundation, presents a synthesis of the findings that emerged during a conference of early care and education practitioners on promoting school success (*Promoting School Success: Transforming Research into Policy and Practice* (January 2002), sponsored by the Child

Development Policy Institute Education Fund and the Child Development Policy Institute). The recommendations that emerged are organized into the following five thematic areas: (1) “Early Brain Development,” (2) “How Children Learn,” (3) “Long Term Cost Benefits,” (4) “Importance of Caregivers,” and (5) “Communication Across Disciplines.” It notes that to be effective, programs, services, and policies that promote the healthy development of young children must consider the whole child (i.e., their social-emotional, language, physical, and cognitive development) and their simultaneous roles as members of families, schools, communities, and cultures. This resource is available on the Web at <http://www.childlinkca.org/pdf/ProSchSuc.pdf>.

■ “Public Attitudes Toward Early Care” (2003), an *Early Childhood Education Fact Sheet*, by the Early Care and Education Collaborative, describes trends in public attitudes toward early childhood education. There is a growing awareness that child brain development and learning begins extremely early in life. Early care is seen as a key component of welfare reform and as a workforce support for parents. Supporters of extended preschool assistance for working families believe that many young parents need help with parenting skills. The public supports quality preschool with well-trained providers. This resource is available on the Web at <http://www.earlycare.org/patec.pdf>.

■ “Connecting Brain Development Research to State Early Childhood Policy” (June 2002), in *NCSL State Legislative Report* Vol. 27, No. 12, by Bina Patel, published by the National Conference of State Legislatures (NCSL), examines State legislative activity surrounding early childhood and brain development research. State legislative policy activity has focused on several areas of early childhood: (1) family and community engagement, (2) school readiness, (3) quality child care, and (4) coordination of services. A list of State legislative reports is included for January 2002 through June 2002. Additional information is available from NCSL, Publications Division, at 303-364-7812 or on the Web at <http://www.ncsl.org/programs/pubs/pubs.htm>.

■ *The White House Summit On Early Childhood Cognitive Development* (July 2001), by Janet K. Black, published by the Texas Engineering Extension Service, The Texas A&M University System, shares research presented at the White House Summit on Early Childhood Cognitive Development (July 2001, Georgetown University, Washington, DC) regarding the importance of the early years (birth–5) in cognitive development and subsequent success in school. Programmatic efforts that facilitate cognitive, language, and preliteracy development in the very young are described. Summaries are presented of the following major presentations: (1) “Born to Learn: Language, Reading, and Brain of the Child” (Patricia K. Kuhl); (2) “Cognitive Development in the Preschool Period” (Grover Whitehurst); (3) “The Role of Parents and Grandparents in Children’s Cognitive Development: Focus on Language and Literacy” (Dorothy Strickland); (4) “Access to Print: Problems, Consequences and Instructional Solutions” (Susan B. Neuman); and (5) “Supporting Cognitive Development in Early Childhood” (Susan H. Landry). Other remarks by participants are listed. This resource emphasizes that brain research demonstrates the importance of young children’s experience and interactions with adults early in life (birth–5) for cognitive, language, and literacy development. Successful cognitive, language, and preliteracy development provide the basis for learning to read and later school success. This resource is available on the Web at <http://sago.tamu.edu/aapr/WhHseReport.pdf>.

■ *Innovative Approaches: Using Brain Development Information to Promote Partnerships* (January 2001), by the Child Care Partnership Project, funded by the Child Care Bureau, Administration for Children and Youth, U.S. Department of Health and Human Services, provides examples that demonstrate how public-private partnerships are using brain development information to enhance systems of early care and education. This resource is available on the Web at <http://nccic.org/ccpartnerships/facts/fs16.htm>.

■ *First Three Years: A Governor's Guide to Early Childhood* (2001), by the National Governors' Association (NGA) Center for Best Practices, is a tool to help governors and their policy advisors convey the importance of investing in a child's first three years to legislators, parents, businesses, and other community members who can become partners in the effort to give children a better start in life. First written in 1997 under the direction of NGA Chairman Governor Bob Miller of Nevada, this guide is now maintained as a Web site to provide links to the latest reports, initiatives, and information on early childhood. This resource is available on the Web at http://www.nga.org/center/divisions/1,1188,T_CEN_EDS%5EC_ISSUE_BRIEF%5ED_1634,00.html.

■ *Early Childhood Summit, Washington, DC, June 23, 2000: Remarks as Prepared for Delivery by U.S. Secretary of Education Richard W. Riley* (June 2000), by Richard W. Riley, comprises remarks at the Early Childhood Summit in Washington, DC, on June 23, 2000. The paper notes the emergence of a national consensus about the value of early childhood education. It maintains that brain development research coupled with new research on how children learn to read has given child care advocates and educators clear direction about setting public and educational policy. This resource is available on the Web at <http://www.ed.gov/Speeches/06-2000/000623a.html>.

■ *Linking Neuroscience to the Care and Education of Young Children: Prenatal to Kindergarten Entry*, prepared by the Parents As Teachers National Center (PATNC), Inc., is a resource for practitioners working with parents to help them provide the most nurturing environment for their children. Information about the availability of this resource is available from PATNC on the Web at <https://secure.patnc.org/catalog/>.

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